REMARKS

Reconsideration of the present application is respectfully requested. Claims 1-34 are pending in this application. Claims 1-34 stand rejected. The rejections are traversed. Therefore, all claims are allowable and action to that effect is respectfully requested.

Claims 1-12, 17, 19-24, 27, 28, and 30-34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (USPN 6,234,023). These rejections are traversed. It is well settled that in order to establish a *prima facie* case of obviousness, there must be some motivation to modify the reference in the manner asserted. MPEP 2143 The mere fact that a reference *can* be modified is not sufficient; the art must also suggests *the desirability* of the modification. MPEP 2143.01 citing In re Mills, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis added) Further, if the proposed modification would render the reference being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. Id. citing In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984)

The Action acknowledges that Collins does not teach reflecting ultrasound from the intersection of surface 22 and the sidewall of container 10. Instead, the Action asserts that Collins "*can easily be manipulated* to transmit a signal that encounters an intersection of the container as well as the surface of the contents." (Office Action page 3, emphasis added) However, even assuming this were true, it does not establish a *prima facie* case of obviousness. Just because a technical manipulation is allegedly *easy* does not mean that it is also *desirable.* For even a "technologically simple concept" is nonobvious when there is no objective reason to

modify a reference or combine reference teachings to make the claimed invention. MPEP 2143.01 citing In re Kotzab, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) Nothing in Collins suggests any advantage in reflecting ultrasound from the intersection of surface 22 and the sidewall of container 10. Rather, it is Applicants' disclosure, not the references cited in the Action, that describes the use of this "corner" reflection and its advantages in ultrasonic liquid level monitoring (e.g. all the acoustic measurements may be taken from a single container location). Using Applicants' own disclosure as the source of the motivation to modify a reference is impermissible hindsight analysis. Accordingly, the asserted modification of Collins is improper and the rejections must be withdrawn.

Moreover, properly considering the reference as a whole, the asserted manipulation of Collins to utilize a "corner" reflection would not be "easy". In fact, it would seem to render Collins unsuitable for its intended purpose. Collins is directed to detecting the liquid level of beverage containers 10 moving on a production line. (col. 1, lines 5-10) Collins generates ultrasound with a dedicated generation means on one side of the conveyor and receives the response with a receiver on the opposite side. Specifically Collins generates a plasma from a focused laser pulse or an electric spark strike near the container wall to produce the ultrasound, and Collins employs an electromagnetic acoustic transducer (EMAT) for detection. (col. 7, lines 26-40; col. 8 lines 12-13; col. 8 lines 54-67) Collins explains that by using a pulsed laser to generate the ultrasound, beverage cans can be measured in rapid succession, for example "30, 40 or 50 per second." (Col. 4, lines 39-40) While the Action does not specify precisely how Collins would be modified to use a corner reflection, moving the source 28 and detector 30 to the same side of the container would create an undesirable crowding of components on one side of the conveyor. But more significantly, when operated in close proximity, the plasma generated

from the focused laser pulse or electric spark strike would surely be disruptive to the operation of the EMAT receiver 30. Thus, the asserted modification would likely render Collins inoperative, and the rejections must be withdrawn.

In addition to the patentability of the base claims, additional reasons support the patentability of the dependent claims. For example, referring to claims 3 and 22, the Action erroneously asserts that FIG. 1 of Collins shows interrogation along two non-parallel inclined axes. It does not. The Action may have intended to reference FIG. 5 of Collins. However, claim 3 depends from claim 2. Thus claim 3 recites interrogating along a generally horizontal axis as well as interrogating along at least two non-parallel inclined axes. Likewise, claim 22 recites transducer elements adapted to transmit ultrasound in three different non-parallel directions. FIG. 1 and FIG. 5 of Collins each only show two interrogation directions, not the three directions recited in claim 3 or claim 22. FIG. 5 does not show interrogation along a generally horizontal axis, and FIG. 1 does not show interrogation along two non-parallel inclined axes.

With respect to claims 4 and 24, the Action erroneously asserts that FIGS. 1, 2, and 2' of Collins show *divergence* of about 15 and 35 degrees. The Action appears to confuse the angular direction of an ultrasound pulse with its divergence. FIGS. 1, 2 and 2' of Collins show the angular direction of the ultrasound via a dashed line. This teaches nothing regarding divergence. Rather, FIGS. 3 and 4 of Collins are stated to illustrate divergent and directional ultrasonic wavefronts. (see col. 5, lines 29-32). However, Applicants find no reference in Collins to specific angles of divergence.

With respect to claim 5, the Action refers to Collins' use of geometrically small active areas at the generation and detection points. However, claim 5 refers to pulse width. While it

may be possible to generate a pulse having the claimed pulse width with Collins' system, the size of the generation and detection points is not determinative of pulse width.

Referring to claims 7, 27, and 28, the Action asserts that, based on the graphical presentations in FIGS. 2 and 2' of how the ultrasonic waves may change with changes in liquid level, Collins "infers and/or suggest[s] the use of a weighted average of the time series as claimed." Applicants respectfully disagree. Collins determines height based on a time difference between two signals. However, Collins does not describe repeating his measurement procedure "to determine a time series of values corresponding to height" and then to determine fill level "based on a weighted average of the time series." (claim 7) Rather, considering Collins is concerned with measuring containers passing on a conveyor at a rate of about "30, 40, or 50 per second", it is likely that Collins relies on a single measurement per container, not a "statistical aggregation of a series of fill level estimates." (claim 27)

With respect to claim 9, the Action alleges that Collins discloses ultrasound having different encoded information transmitted in different directions. Applicants do not agree. The Action simply points to FIG. 1, but Applicants do not see any reference to encoded information in FIG. 1 or anywhere else in the Collins reference.

With respect to 10, 19, and 21, the Action acknowledges that Collins does not disclose a plurality of ultrasonic transducers. Instead, the Action asserts that to provide a plurality of transducers merely involves "duplicating the components" of a prior device. Applicants disagree. As mentioned above, the ultrasonic source 28 of Collins is not a transducer at all. It is a pulsed laser (or electric spark strike), which can create ultrasound but does not also function as an ultrasound receiver. Moreover, even if Collins' source 28 were a transducer (which it is not), the rejected claims at issue recite a plurality of transducer elements *in a common housing*.

Nothing in Collins suggests multiple transducer elements in a common housing. Thus, more than a mere "duplication of components" is involved.

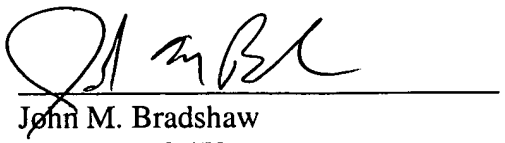
Claims 12-16, 25, 26 and 29 stand rejected under 35 U.S.C. §103 as being unpatentable over Collins in view of Holden (5,438,868). These rejections are traversed. The Action erroneously assumes that element 28 of Collins is a transducer. It is not. But even if it were, coupling a transducer to the sidewall of the container, as taught by Holden, would destroy the operability of Collins. As described above, Collins describes a system for detecting the fill level of containers passing on a conveyor. Holden describes an assembly that is physically strapped to a container (see FIG. 1). The Action does not explain how a transducer assembly would be strapped and unstrapped from a container passing on a conveyor, particularly where the containers pass at a rate of 30 or more per second. The challenges of accomplishing this feat would be so great as to render it impractical if not impossible. Therefore, because Collins would cease to function as an inspection system for containers on a conveyor if modified in the manner asserted, the combination is improper.

Applicants note that, in addition to being improper, the combination of Holden into Collins does not address other deficiencies with Collins. For example, Holden does not describe multiple transducer elements in a housing or determining fill level by detecting a corner reflection as recited in claim 29. Likewise, the further combination with Arndt as asserted with respect to claim 18, even if proper, does not cure the deficiencies of the base claim rejection.

Reconsideration of the present application is respectfully requested. In view of the forgoing, all pending claims are patentable over the art. Therefore, the Application is seen to be in condition for allowance. In a telephone call on August 4, 2004, the Examiner acknowledged that the supplemental oath/declaration filed December 29, 2003 was received by the Office and

properly contained all the requisite inventor address information. Applicants are submitting herewith an Application Data Sheet to update the mailing address for Kayte M. Judd. The address information for the remaining inventors is unchanged. The undersigned would welcome a telephone call to discuss any matter that would expedite prosecution of the present application.

Respectfully submitted,



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